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WILSON, VERNA JEAN. A Comparison of Selected Personality Traits of College Women Who Participate in Varsity Team Sports, Varsity Individual Sports, and a College Dance Company. Directed by: Dr. Rosemary McGee. Pp. 82

The purpose of this research was to compare selected personality factors for each group of college women who participated in a college dance company, varsity team sports of field hockey, basketball, and volleyball, and varsity individual sports of tennis and golf.

Seventy-eight female undergraduate students from The University of North Carolina at Greensboro completed a Personal Data Sheet and the Cattell Sixteen Personality Factor Questionnaire. A one-way analysis of variance was used to determine if, on twenty factors, differences in personality existed among (1) dancers, varsity team sport players, and varsity individual sport players, (2) varsity team sport players on field hockey, basketball and volleyball teams, and (3) between varsity individual sport players who were tennis players and golfers. Also, a t test was used to determine if the above three groups were different from Cattell's normative group on the twenty factors.

This study showed that a fairly similar distribution of personality traits existed for the six groups tested. It was possible to have had 140 significant differences from the analyses of variance tests. Only ten factors were significantly different at the five percent level of confidence.

Dancers were more tender-minded and more tense than the varsity team sport players. Varsity field hockey players were more apprehensive than varsity volleyball players who were more

self-assured. However, the varsity field hockey players were more self-sufficient and less group dependent than the varsity volleyball players. Varsity field hockey players were more tense than either the varsity volleyball or basketball players. Similarly, varsity field hockey players showed higher anxiety than either of the other two varsity team sport groups. Varsity field hockey players were more independent than varsity volleyball players who were more group dependent. Varsity golfers were more conscientious and persevering than the varsity tennis players.

The six groups were similar to Cattell's normative group on seventy percent of the personality traits tested. The t results at the five percent level of confidence revealed thirty-five significant differences out of a possible 120.

Dancers were more assertive, apprehensive, tense, anxious, and independent than the normative group. They were less outgoing and less emotionally stable than the normative group. Golfers were more conscientious, practical, and controlled. Tennis players were more tough-minded, practical, and alert than the normative group. The volleyball players were more tough-minded, self-assured, group dependent, relaxed, had lower anxiety yet were more alert and subdued than the normative group. Varsity basketball players were more tough-minded, practical, and alert when compared to the normative group. Varsity field hockey players had the greatest number of significant differences. They differed from Cattell's group on eleven of the twenty factors. They were more assertive, tough-minded, suspicious, forthright, apprehensive, experimenting, self-sufficient, tense, anxious, alert, and independent.

A COMPARISON OF SELECTED PERSONALITY TRAITS OF
COLLEGE WOMEN WHO PARTICIPATE IN VARSITY
TEAM SPORTS, VARSITY INDIVIDUAL SPORTS,
AND A COLLEGE DANCE COMPANY

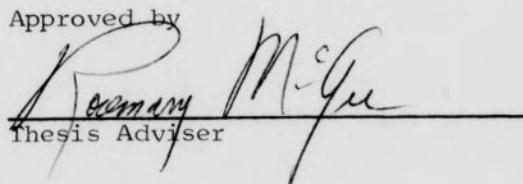
by

Verna Jean Wilson

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CHAPTER I

INTRODUCTION

We are still not certain whether sport participation and associated resultant levels of ability is an extension or a modifier (or both perhaps) of an individual's personality. It may well be that certain personality dimensions receive greater reinforcement within the competitive world of sport. Also, personality factors may be all-important to athletic performance, particularly at high levels of sports participation. (10:20)

There is some thought that a general sport personality might exist. The question is, how general? Do individuals who participate in sports have certain personality traits in common, or are some personality traits more dominant among people who participate in a certain sport?

It is the purpose of the present investigation to study personality profiles of women who participate in different sports and in dance. Over a period of time, the author has observed that there seems to be a difference in the "personality type" of those who choose to participate in team sports rather than dance. If dancers exhibit certain dominant personality traits which are different from the dominant personality traits exhibited by team sport people, then it is possible that those who play individual sports also may exhibit personality traits which are characteristic of their group.

Although a number of studies have been made on the personality of the male athlete, very few studies have been done

on the female athlete and even fewer on dancers. Because physical educators emphasize the development of the whole person and are concerned with each individual, it would seem that they need to know more about the relationship between participation and personality characteristics.

Personality is shaped during the early years of life. This may mean that in later years it is resistant to change. However, even as late as college years, personality changes, that is modifications and adjustments, may still be occurring. If physical education programs and co-curricular activities are to influence the individual's development by either modification or extension, it appears that more knowledge is needed on the personality make-up of individuals who participate in the various sport and dance programs. Such knowledge would assist teachers when planning programs and when counseling students on elective courses and co-curricular activities.

CHAPTER II

STATEMENT OF PROBLEM

The Problem

The purposes of this study were to compare selected personality factors of college women (a) who participate in varsity team sports, varsity individual sports, and a college dance company, (b) who participate in the varsity team sports of field hockey, basketball, and volleyball, (c) who participated in the varsity individual sports of tennis and golf, and (d) in addition, to compare participants in varsity team sports, varsity individual sports, and a college dance company with a normative group.

Definition of Terms

Dancer. A female undergraduate student who tried out for and was selected for the college dance company. Participation in the dance company was for one or two semesters of the college year.

Varsity player. A female undergraduate student who tried out for and was selected for a college varsity team during the college year.

Varsity team sports. The three major team sports were field hockey, basketball, and volleyball.

Varsity individual sports. The two major individual sports were tennis and golf.

Personality factor. The term given to groups of collected responses or reactions which have a common unifying bond.

Personality. The sum total of personality factors combining to manifest the individual's behavior.

Limitations

1. There was considerable overlapping of varsity players among the various teams. A number of the subjects played on more than one of the varsity teams.
2. The School of Health, Physical Education and Recreation at The University of North Carolina at Greensboro had a philosophy of maximum opportunity for participation; consequently, the number of players selected for various teams was large and perhaps not as selective as might be anticipated.

Hypotheses

For the purpose of this study, six null hypotheses were established:

1. There is no difference in each of Cattell's sixteen primary factors and each of the four F factors among dancers, varsity team sport players, and varsity individual sport players.
2. There is no difference in each of Cattell's sixteen primary factors and each of the four F factors among varsity team sport players in field hockey, basketball, and volleyball.

3. There is no difference in each of Cattell's sixteen primary factors and each of the four F factors between varsity tennis players and golfers.
4. There is no difference in each of Cattell's sixteen primary factors and each of the four F factors between dancers and Cattell's normative group.
5. There is no difference in each of Cattell's sixteen primary factors and each of the four F factors between varsity team sport players and Cattell's normative group.
6. There is no difference in each of Cattell's sixteen primary factors and each of the four F factors between varsity individual sport players and Cattell's normative group.

CHAPTER III

REVIEW OF LITERATURE

The material reviewed in this chapter includes three main topics related to this study. The three topics are definitions of personality, personality measurement tools, and past studies which are pertinent.

Definitions of Personality

Before examining the research on personality, the term personality must be understood. It has been defined many ways over the years. No one definition was correct or ultimate in its description. Some common denominators were to be found within definitions. Lazarus defined personality as ". . . the organization of stable structures within a person that dispose him to act in certain ways." (8:503)

A definition which stressed similar characteristics was Allport's: "Personality is the dynamic organization within the individual of those psychological systems that determine his characteristic behavior and thought." (1:593)

Freeman's definition of personality was even more descriptive and comprehensive.

Personality is described in terms of the individual's behavior - his actions, postures, words, and attitudes and opinions regarding his external world. But personality is described also in terms of the individual's covert feelings about his external world; feelings which may not be apparent or discernible in his overt behavior.

Furthermore, it is described in terms of one's feelings about himself. (5:518)

Measures of Personality

Tools to examine personality were developed and refined as knowledge and understanding of it increased. One type developed was the observation and interview test. The questions used in this type of test ranged from free to specifically structured questions. There were limitations with this method of testing such as the time it took to be efficient, the necessity for the tester to be skilled in asking questions and making observations, and then later skill in categorizing and analyzing data were needed.

Eventually paper and pencil tests, a type of standardized tests, were developed. The written test questions were structured and restrictive in nature but provided a reliable and objective instrument. Scoring was fairly simple and most tests could be given in a short period of time. Also, within the standardized tests, there was variety both in emphasis and the number of traits measured. The Edwards Personal Preference schedule utilized the force choice technique. Other tests, such as Bernreuter Personality Inventory and Cattell's Sixteen Personality Factor Questionnaire, measured varying numbers of personality traits. The Minnesota Multiphasic Personality Inventory test emphasized the measurement of personality traits within the normal-abnormal range. The California Psychological Inventory was concerned with favorable characteristics of personality rather than pathological

aspects. Its scales measured social living and social interaction. The Omnibus Personality Inventory was constructed to study college groups. It differentiated among attitudes of students majoring in different areas of study and from different schools. (12) These tools were used to relate personality to some type of physical performance in the studies which were reviewed.

The studies examined have been divided into three broad categories: (1) studies involving high school participants and non-participants in sports; (2) studies involving college male athletes, non-athletes, and superior athletes; (3) studies involving college female athletes, non-athletes, and superior athletes.

Studies Involving High School Participants and Non-Participants in Sports

Tillman (20) administered the AAHPER fitness test to 386 junior and senior high school males for the purpose of selecting the upper and lower 15 percent. These subjects were then given the A.S. Reaction Study of Allport, Cattell's Sixteen Personality Factor Questionnaire, and the Kruder Preference Record, Form C. The upper 15 percent group differed significantly from the lower 15 percent group on personality traits. They were more surgent, had greater social dependence, and were less tense.

The lower 15 percent group was divided into two groups: an experimental group received a fitness program, and a control group had the required physical education program. There were no significant personality differences between the two groups, but

the level of fitness of the experimental group improved significantly.

The California Psychological Inventory, which deals with social living and social interaction, was used by Schendel (16) to examine the psychological characteristics of male athletes and non-athletes. Three levels were studied: grade nine, grade twelve, and college level. Differences were found between the athletes and non-participants at the ninth and twelfth grade levels. Athletes possessed greater personal worth, sociability, and were more conventional in their responses to social situations. The non-athlete at the college level appeared to possess more qualities which led to status. They were more conscientious, tolerant, responsible, intellectual, independent, and adaptable in their thinking and social behavior.

Slusher (19) also did a study with high school male athletes and non-athletes. The non-participants numbered one hundred. The four hundred athletes selected had won major sports awards and represented the sports of baseball, football, basketball, swimming, and wrestling. Slusher administered the Lorge-Thorndike Intelligence Test and the Minnesota Multiphasic Personality Inventory. The latter is an instrument which measures an individual's trait assessment within the abnormal range of a normal-abnormal continuum.

Lower scores on intelligence and femininity were reported for the athletic group. The same group scored significantly higher on hypochondriasis. The swimmers were an exception. Because swimmers do not have to tape themselves, Slusher suggested this

was the reason they did not seem to be concerned with body functions and physical symptoms. The football group had the most neurotic profile and used physical symptoms as a means for solving conflict. Wrestlers likewise had a neurotic profile evidenced by worry and fear. They scored lowest on intelligence and were reported to be least capable of concentration. Basketball players were overly concerned with physical symptoms and showed a lack of repression. Baseball players showed evidence of great risk taking and worry.

Studies Involving College Male Athletes, Non-Athletes, and Superior Athletes

Using the Cattell Sixteen Personality Factor Questionnaire and the Minnesota Multiphasic Personality Inventory, Kroll (11) examined ninety-four amateur, collegiate, and superior wrestlers. Thirty-three wrestlers were average to below average wrestlers from collegiate teams. Thirty-three were rated as excellent collegiate wrestlers. Twenty-eight wrestlers were from the United States Olympic Team and the NCAA or NAIA champion place winners. Although no significant differences were found among the three groups of wrestlers, significant differences from the norm were established. The differences indicated that wrestlers were more tough-minded, self-reliant, and masculine. Kroll did not find that wrestlers had a neurotic profile. He suggested two reasons for his findings to be different from Slusher's. Either the wrestler who was not tough-minded dropped out of the sport before he reached higher levels of competition or, because of the sport, the athlete participating in it became more tough-minded.

Two hundred and thirty male athletes from a state university, a private university, and two state colleges were subjects studied by Lakie. (12) They represented the following sports: basketball - 33, football - 67, tennis and golf - 38, track and field - 55, and wrestling - 33. They were given five scales from the Omnibus Personality Inventory. Lakie used the attitude inventory to assess the personality characteristics of the subjects according to various types of groups. There were no significant differences among the 230 subjects when grouped according to sport. However, within the type of institutional groups, differences occurred. Athletes at the private university scored highest on social maturity. The state university athletes who participated in tennis and golf scored higher on social maturity than did the tennis players and golfers from the state colleges.

Singer (18) studied the personality differences between and within college baseball and tennis players. He asked coaches to rank varsity baseball and tennis players and freshman baseball players according to skill. Then he selected the ten highest skilled freshman baseball players, the ten highest skilled varsity baseball players, the ten lowest skilled freshman baseball players, the ten lowest skilled varsity baseball players, and the five highest and five lowest skilled varsity tennis players.

The Edwards Personal Preference Schedule, which is a forced-choice test, was administered to the subjects. The results showed that the high skill tennis group was above the norm on achievement while the low skill tennis group was below the norm on achievement. No significant differences were noted between the

high and low baseball groups. A comparison between tennis and baseball players indicated a difference on achievement, intra-ception, dominance, and abasement. Baseball players were higher on abasement, and tennis players were higher on the other three traits.

Werner and Gottheil (21) studied 752 new cadets at the United States Military Academy to see if four years of athletic participation changed personality characteristics. One hundred and ninety-one males were classified as non-participants upon entry. One hundred and seven had previously participated in athletics, and 454 had won sport letters before entering the Academy. The subjects were given Cattell's Sixteen Personality Factor Questionnaire at the time of admittance and again at graduation time. There was a difference on seven personality factors at the time of entrance between participants and non-participants. However, at the time of graduation, there were no significant differences between the groups even though all had participated in an extensive athletic program.

Studies Involving College Female Athletes, Non-Athletes, and Superior Athletes

Hein (22) used the Bernreuter Personality Inventory to compare the personality traits of 1,702 college women who resided in college dormitories. The subjects were divided into similar interest groups: (a) physical education major group, (b) dance group, (c) team sport group, and (d) non-activity group. All of the women were similar to college women in general on the six

traits measured. The non-activity group was more self-sufficient than the team sport group and less sociable than the physical education major group and team sport group. This was established at the one percent level of confidence. At the same level of confidence, the dance group indicated a greater tendency toward introversion and less sociability than the physical education major and team sport groups. They also were more neurotic and less emotionally stable.

Schrechengaust (17) administered the Edwards Personal Preference Schedule to seventy-one college women who played either individual or team sports. Riflery, fencing, gymnastics, bowling, golf, and tennis were the individual sports and hockey, basketball, softball, and lacross were the team sports. No significant difference between the two groups was noted for fifteen variables, except on heterosexuality. The individual sport group had a significantly higher mean on this variable.

Malumphy (13) examined seventy-seven women athletes who had participated in intercollegiate competition. The individual sport group was composed of the following sports: tennis, golf, fencing, archery, competitive and synchronized swimming, and gymnastics. The team sports represented were basketball, field hockey, and softball. Another group consisted of women who played both team and individual sports, while the last group was a non-participant group of forty-two women. The team sport group was more anxious than the individual sport group, and more reserved than the team-individual group. The individual group was more

tough-minded than the non-participants, and more venturesome, extraverted, and less anxious than the team sport group. They also displayed more leadership than all other groups.

The test used by Malumphy was the Cattell Sixteen Personality Factor Questionnaire. She used the same test to study college women athletes who had participated in national tennis and golf tournaments. (14) Her conclusions, arrived at after a two-year testing period, were that women athletes seemed to be more intelligent and tough-minded than their peers. They may have a tendency to be more reserved, assertive, stable, happy-go-lucky, suspicious and casual. Malumphy believed that sport competition provided for the expression of such differences.

Peterson (15) used the Cattell Sixteen Personality Factor Questionnaire to examine the personality traits of ninety-seven women from the 1964 United States Olympic team. The thirty-eight women of the individual sport group was composed of swimmers, divers, riders, fencers, canoeists, gymnasts and track and field athletes. They rated highest on dominance, adventurous, sensitivity, introversion, radicalism, and self-sufficiency. They were lower than the team sport athletes on sophistication. The fifty-nine team sport athletes represented the sports of volleyball, tennis, and basketball (AAU). These athletes scored higher on sophistication and were self-sufficient, reliable, realistic, and tended toward group solidarity. Both groups were more serious, and expressed themselves less than the average. They were more intelligent, conscientious, persevering, and aggressive than the normal population.

Summary

The research examined demonstrated that certain personality traits were dominant in both the beginning and non-participant in sports. When they had the same personality traits as demonstrated by athletes, such traits were found to be emphasized to a lesser or greater degree. It cannot be claimed that athletes developed personality traits because they participated in different sports; nor can it be said that, because of existing personality traits, an individual chose a sport. The cause-effect conclusion cannot be made until such a time as further research is available.

However, it seems justifiable to state that a difference in personality traits possibly exists between athletes who participated in individual sports and those who participated in team sports. Team sport athletes tended to be more group dependent, aggressive, and anxious than individual sport athletes. The latter tended to be more self-reliant, dominant, sensitive, and tough-minded. Superior athletes in both individual and team sports tended to be more reserved and assertive than the normal population.

It was noted that Cattell's Sixteen Personality Factor Questionnaire was accepted, recognized and well established as a reliable tool for measuring personality traits. A further description of this instrument will be found in Chapter IV, because of its use in this study.

CHAPTER IV

PROCEDURE

It was the aim of this study to compare selected personality traits of college women who participated in three main groups: dance, varsity team sports, and varsity individual sports. Comparisons were made among the three groups, and the three groups were then compared to a normative group. Furthermore, personality comparisons were made among the teams that made up the varsity sport group: field hockey, basketball, and volleyball, and also between the two varsity teams, golf and tennis, which comprised the individual sport group.

Test Selection

The Cattell Sixteen Personality Factor Questionnaire was selected for use in this study for several reasons. The test was easy both to administer and to score. Approximate administration time was forty-five minutes. The test did not have to be monitored. Scoring could be done by machine if numbers tested were sufficiently large to merit such treatment or by hand as was the case in this study.

Each of the sixteen factors was independent which meant that the correlation between one and another was usually quite small. Therefore, each of the sixteen primary factors brought new information about the subject. By combining and weighting

certain of the sixteen primary factors' sten scores in a prescribed order, four secondary factors could be obtained. (3)

Also of value to the tester was the fact that norms based on different types of populations had been established and were available. These allowed for a comparison of the subjects with a broad general college female population of 1,679.

Reliability and validity of the test had been established for each of the sixteen primary factors and may be noted in Table I, page 18. The reliability, that is dependability, found from test-retest correlation ranged from .61 for factor N to .81 for Factors A and Q₄ on Form A. Testers were cautioned that within one test form, insufficient questions for factors M, N, and Q₃ were likely responsible for their low reliabilities. Factor B (intelligence) cannot meaningfully be repeated after a short interval.

Like reliability, the validity was given for each separate factor. It was determined after many questions had been devised, tried, revised, omitted, and finally survived three factor analyses on different samples of subjects. The concept validity coefficient was about .85 and was accepted as a good measure of the personality factors. (3)

In order to understand the sixteen primary factors and the four secondary factors, a description of each, taken directly from the Cattell Manual of the Sixteen Personality Factor Questionnaire, is given on page 19. (3:13-24)

TABLE I

RELIABILITY AND VALIDITY COEFFICIENTS OF THE
INDIVIDUAL SCALES COMPRISING CATTELL'S
SIXTEEN PERSONALITY
FACTOR QUESTIONNAIRE

Factor	Reliability - Form A Test-Retest After Six Days	Direct Validi- ties Form A
A	.81	.77
B	-	.62
C	.75	.71
E	.80	.66
F	.79	.73
G	.81	.63
H	.83	.87
I	.77	.71
L	.75	.63
M	.70	.58
N	.61	.52
O	.79	.75
Q ₁	.73	.66
Q ₂	.73	.62
Q ₃	.62	.58
Q ₄	.81	.75

Primary Factors

Factor A

Reserved: Detached, Critical, Cool

The person who scores low (sten of 1 to 3) on Factor A tends to be stiff, cool, skeptical, and aloof. He likes things rather than people, working alone, and avoiding compromises of viewpoints. He is likely to be precise and "rigid" in his way of doing things and in personal standards, and in many occupations these are desirable traits. He may tend, at times, to be critical, obstructive, or hard.

vs

Outgoing: Warmhearted, Easy-going, Participating

The person who scores high (sten of 8 to 10) on Factor A tends to be goodnatured, easy-going, emotionally expressive (hence naturally affectothymia), ready to cooperate, attentive to people, soft-hearted, kindly, adaptable. He likes occupations dealing with people and socially - impressive situations. He readily forms active groups. He is generous in personal relations, less afraid of criticism, better able to remember names of people.

Factor B

Less Intelligent: Concrete - thinking

The person scoring low on Factor B tends to be slow to learn and grasp, dull, given to concrete and literal interpretation. His dullness may simply be a reflection of low intelligence, or it may represent poor functioning due to psychopathology,

vs

More Intelligent: Abstract - thinking, Bright

The person who scores high on Factor B tends to be quick to grasp ideas, a fast learner, intelligent. There is some correlation with level of culture, and some with alertness. High scores contraindicate deterioration of mental functions in pathological conditions.

Factor C

Affected by Feelings: Emotionally Less Stable, Easily Upset

The person who scores low on Factor C tends to be low in frustration tolerance for unsatisfactory conditions changeable and plastic, evading necessary reality demands, neurotically fatigued, fretful, easily emotional and annoyed, active in dissatisfaction, having neurotic symptoms (phobias, sleep disturbances, psychosomatic complaints, etc.). Low Factor C score is common to almost all forms of neurotic and some psychotic disorders.

vs

Emotionally Stable: Faces Reality, Calm, Mature

The person who scores high on Factor C tends to be emotionally mature, stable, realistic about life, unruffled, possessing ego strength, better able to maintain solid group morale. Sometimes he may be a person making a resigned adjustment to unsolved emotional problems.

Factor E

Humble: Mild, Accommodating, Conforming

The person who scores low on Factor E tends to give way to others, to be docile, and to conform. He is often dependent, confessing, anxious for obsessional correctness. This passivity is part of many neurotic syndromes.

vs

Assertive: Independent, Aggressive, Stubborn

The person who scores high on Factor E is assertive, self-assured, and independent-minded. He tends to be austere, a law to himself, hostile or extrapunative, authoritarian (managing others), and disregards authority.

Factor F

Sober: Prudent, Serious, Taciturn

The person who scores low on Factor F tends to be restrained, reticent, introspective. He is sometimes dour, pessimistic, unduly deliberate, and considered smug and primly correct by observers. He tends to be a sober, dependable person.

vs

Happy-Go-Lucky: Impulsive, Lively, Gay, Enthusiastic

The person who scores high on this trait tends to be cheerful, active, talkative, frank, expressive, effervescent, carefree. He is frequently chosen as elected leader. He may be impulsive and mercurial.

Factor G

Expedient: Evades Rules, Feels Few Obligations

The person who scores low on Factor G tends to be unsteady in purpose. He is often casual and lacking in effort for group undertakings and cultural demands. His freedom from group influence may lead to anti-social acts, but at times makes him more effective, while his refusal to be bound by rules causes him to have less somatic upset from stress.

vs

Conscientious: Persevering, Staid, Rule-bound

The person who scores high on Factor G tends to be exacting in character, dominated by sense of duty, persevering, responsible, planful "fills the unforgiving minutes." He is usually conscientious and moralistic, and he prefers hard-working people to witty companions. The inner "categorical imperative" of this essential superego (in the psychoanalytic sense) should be distinguished from the superficially similar "social ideal self" by Q_3 .

Factor H

Shy: Restrained, Diffident, Timid

The person who scores low on this trait tends to be shy, withdrawing, cautious, retiring, a "wallflower." He usually has inferiority feelings. He tends to be slow and impeded in speech and expressing himself, dislikes occupations with personal contacts, prefers one or two close friends to large groups, and is not given to keeping in contact with all that is going on around him.

vs

Venturesome: Socially-bold, Uninhibited, Spontaneous

The person who scores high on Factor H is sociable, bold, ready to try new things, spontaneous, and abundant in emotional response. His "thick-skinnedness" enables him to face wear and tear in dealing with people and grueling emotional situations, without fatigue. However, he can be careless of detail, ignore danger signals, and consume much time talking. He tends to be "pushy" and actively interested in the opposite sex.

Factor I

Tough-minded: Self-reliant, Realistic, No-nonsense

The person who scores low on Factor I tends to be practical, realistic, masculine, independent, responsible, but skeptical of subjective, cultural elaborations. He is sometimes unmoved, hard, cynical, smug. He tends to keep a group operating on a practical and realistic "no-nonsense" basis.

vs

Tender-minded: Dependent, Overprotected, Sensitive

The person who scores high on Factor I tends to be tender-minded, day-dreaming, artistic, fastidious, feminine. He is sometimes demanding of attention and help, impatient, dependent, impractical. He dislikes crude people and rough occupations. He tends to slow up group performance, and to upset group morale by unrealistic fussiness.

Factor L

Trusting: Adaptable, **Free** of Jealousy, Easy to Get on With

The person who scores low on Factor L tends to be free of jealous tendencies, adaptable, cheerful, uncompetitive, concerned about other people, a good team worker.

vs

Suspicious: Self-opinionated, Hard to Fool

The person who scores high on Factor L tends to be mistrusting and doubtful. He is often involved in his own ego, is self-opinionated, and interested in internal, mental life. He is usually deliberate in his actions, unconcerned about other people, a poor team member.

Factor M

Practical: Careful, Conventional, Regulated by External Realities, Proper

The person who scores low on Factor M tends to be anxious to do the right thing, attentive to practical matters, and subject to the dictation of what is obviously possible. He is concerned over detail, able to keep his head in emergencies, but sometimes unimaginative.

vs

Imaginative: Wrapped up in Inner Urgencies, Careless of Practical Matters, Bohemian

The person who scores high on Factor M tends to be unconventional, unconcerned even for everyday matters, Bohemian, self-motivated, imaginatively-creative, concerned with "essentials," and oblivious of particular people and physical realities. His inner-directed interests sometimes lead to unrealistic situations accompanied by expressive outbursts. His individuality tends to cause him to be rejected in group activities.

FACTOR N

Forthright: Natural, Artless, Sentimental

The person who scores low on Factor N tends to be unsophisticated, sentimental, and simple. He is sometimes crude and awkward, but easily pleased and content with what comes, and is natural and spontaneous.

vs

Shrewd: Calculating, Worldly, Penetrating

The person who scores high on Factor N tends to be polished, experienced, worldly, shrewd. He is often hard-hearted and analytical. He has an intellectual, unsentimental approach to situations, an approach akin to cynicism.

Factor O

Placid: Self-assured, Confident, Serene

The person who scores low on Factor O tends to be placid, with unshakable nerve. He has a mature, unanxious confidence in himself and his capacity to deal with things. He is resilient and secure, but to the point of being insensitive of when a group is not going along with him, so that he may evoke antipathies and distrust.

vs

Apprehensive: Worrying, Depressive, Troubled

The person who scores high on Factor O tends to be depressed, moody, a worrier, full of foreboding, and brooding. He has a child-like tendency to anxiety in difficulties. He does not feel accepted in groups or free to participate. High Factor O is very common in clinical groups of all types.

Factor Q₁

Conservative: Respecting Established Ideas, Tolerant of Traditional Difficulties

The person who scores low on Factor Q₁ is confident in what he has been taught to believe, and accepts the "tried and true," despite inconsistencies, when something else might be better. He is cautious and compromising in regard to new ideas. Thus, he tends to oppose and postpone change, is inclined to go along with tradition, is more conservative in religion and politics, and tends not to be interested in analytical "intellectual" thought.

vs

Experimenting: Critical, Liberal, Analytical, Free-Thinking

The person who scores high on Factor Q₁ tends to be interested in intellectual matters and has doubts on fundamental issues. He is skeptical and inquiring regarding ideas, either old or new. He tends to be well informed, less inclined to moralize, more inclined to experiment in life generally, and more tolerant of inconvenience and change.

Factor Q₂

Group-Dependent: A "Joiner" and Sound Follower

The person who scores low on Factor Q₂ prefers to work and make decisions with other people, likes and depends on social approval and admiration. He tends to go along with the group and may be lacking in individual resolution. He is not necessarily gregarious by choice; rather he needs group support.

vs

Self-Sufficient: Prefers Own Decisions, Resourceful

The person who scores high on Factor Q₂ is temperamentally independent, accustomed to going his own way, making decisions and taking action on his own. He discounts public opinion, but is not necessarily dominant in his relations with others (see Factor E). He does not dislike people but simply does not need their agreement or support.

Factor Q₃

Undisciplined Self-Conflict: Careless of Protocol, Follows Own Urges

The person who scores low on Factor Q₃ will not be bothered with will control and regard for social demands. He is not overly considerate, careful, or painstaking. He may feel maladjusted, and many maladjustments (especially the affective, but not the paranoid) show Q₃-.

vs

Controlled: Socially-precise, Following Self-image

The person who scores high on Factor Q₃ tends to have strong control of his emotions and general behavior, is inclined to be socially aware and careful, and evidences what is commonly termed "self-respect" and regard for social reputation. He sometimes tends, however, to be obstinate. Effective leaders and paranoids are high on Q₃.

Factor Q₄

Relaxed: Tranquil, Torpid, Unfrustrated

The person who scores low on Factor Q₄ tends to be sedate, relaxed, composed, and satisfied (not frustrated). In some situations, his over satisfaction can lead to laziness and low performance, in the sense that low motivation produces little trial and error. Conversely, high tension level may disrupt school and work performance.

vs

Tense: Frustrated, Driven, Overwrought

The person who scores high on Factor Q₄ tends to be tense, excitable, restless, fretful, impatient. He is often fatigued, but unable to remain inactive. In groups he takes a poor view of the degree of unity, orderliness, and leadership. His frustration represents an excess of stimulated, but undischarged, drive.

Second Order Factors

Factor I

Low Anxiety (Adjustment)

The person who scores low on this factor tends to be one whose life is generally satisfying and one who is able to achieve those things that seem to him to be important. However, an extremely low score can mean lack of motivation for difficult tasks, as is generally known in studies related to achievement.

vs

High Anxiety

The person who scores high on this factor is high on anxiety as it is commonly understood. He need not be neurotic, since anxiety could be situational, but it is probable that he has some maladjustment, i.e., he is dissatisfied with the degree to which he is able to meet the demands of life and to achieve what he desires. Very high anxiety is generally disruptive of performance and productive of physical disturbances.

Factor II

Introversion

The people who score low on Factor II tend to be shy, self-sufficient, and inhibited in personal contacts. This can be either a favorable finding, depending upon the particular situation in which the person is expected to function, i.e., introversion is a favorable predictor of precision workmanship.

vs

Extraversion

The person who scores high on this factor is socially outgoing, uninhibited person, good at making and maintaining interpersonal contacts. This can be very favorable in situations that call for this type of temperament, i.e., salesmanship, but should not be considered necessarily favorable as a general predictor, i.e., of scholastic achievement.

Factor III

Tenderminded Emotionality

The person who scores low on Factor III is likely to be troubled by pervasive emotionality, and may be of a discouraged, frustrated type. He is, however, sensitive to the subtleties of life, likely to be artistic and rather gentle. If he has problems, they often involve too much thought and consideration before action is taken.

vs

Alert Poise

The person who scores high on this factor is likely to be an enterprising, decisive, and resilient personality. However, he is likely to miss the subtle relationships of life, and to orient his behavior too much toward the obvious. If he has difficulties, they are likely to involve rapid action with insufficient consideration and thought.

Factor IV

Subduedness

The person who scores low on Factor IV is a group-dependent, chastened, passive personality. He is likely to desire and need support from other persons, and likely to orient his behavior toward persons who give such support.

vs

Independence

The person who scores high on this factor tends to be aggressive, independent, daring, incisive person. He will seek those situations where such behavior is at least tolerated and possibly rewarded, and is likely to exhibit considerable initiative.

Subject Selection

The subjects were seventy-eight female undergraduates at The University of North Carolina at Greensboro who either played a varsity sport or belonged to the college dance company. The varsity players represented the following sports: field hockey - 19, basketball - 17, volleyball - 11, golf - 11, and tennis - 26. Fifteen women were dancers and another dancer played varsity tennis as well.

There was considerable duplication of players among varsity team sports, and between varsity team sports and varsity individual sports. See Table II, page 30. Some subjects' data were used two or three times, that is, for each group for which the subject was a member. Fifty-nine of the seventy-eight subjects participated in only one activity: basketball - 6, volleyball - 4, field hockey - 11, golf - 8, tennis - 15, dance - 15 (modern - 4, ballet - 1). (See Table II, page 30)

All subjects volunteered to participate in the study. Seven varsity players either did not choose to participate or were not available at the times the test was given. These seven were two field hockey players, two basketball players, one volleyball player and two tennis players.

Securing Data

Permission to administer the Cattell Sixteen Personality Factor Questionnaire and a Personal Data Sheet was first sought from the coaches of the teams and from the dance instructors. Subjects were then told the procedure and reasons for the testing.

TABLE II
ANALYSIS OF TOTAL PARTICIPATION OF SUBJECTS IN
VARSITY SPORTS AND DANCE COMPANY
(N = 78)

	Basket- ball	Volley- ball	Field Hockey	Golf	Tennis	Dance	Total
Basketball	6*	4	2		2		14
Volleyball	4	4*		1	1		10
Field hockey	2		11*	1	3		17
Golf		1	1	8*	1		11
Tennis	2	1	3	1	15*		22
Modern dance					1	4*	5
Ballet						1*	1
Volleyball and tennis	1						1
Field hockey and tennis	2						2
Basketball and tennis		1	2				3
Modern dance and tennis						1	1
Modern dance and ballet						10*	10
Field hockey and basket- ball					2		2
Basketball and volleyball					1		1
TOTAL	17	11	19	11	26	16	100

*Participation in only one activity.

For those who volunteered but could not be met in person for testing, contact was first made by phone, and then a package containing the test, personal data sheet and cover letter was delivered. (See Appendix A) Five tennis and golf players received the packages. The information obtained from the personal data sheet was to be used for descriptive purposes. It covered such areas as age, academic major, previous experience in activities, and reasons for present participation in sports and dance. Subjects were told that they could see their personality profiles after the tests had been scored. They were also assured that all information would remain confidential. Thirty of the seventy-eight subjects saw their personality profiles.

The basketball and volleyball teams were tested together. The tennis players and dance company members were given the test on two separate occasions because not all the subjects were available at one time. Golfers and field hockey players were tested in small groups of three and four over a period of several weeks. All testing was completed by the end of a four-week period.

Treatment of Data

After tests were hand scored, raw scores were converted to sten scores. This was done by using the conversion table of the College Female, Form A, Tentative Norms - Normalized Stens. (3) Personality profiles were then drawn for each subject. The four secondary factors were computed by using the sten scores of the sixteen primary factors. (3) Profiles were not drawn for these secondary factors.

Data were recorded on computer cards so that a simple one way analysis of variance and a t-test could be done. (5) The analysis of variance was run on each of Cattell's sixteen personality factors and each of the four F factors: (1) among varsity individual sport players, varsity team sport players and dancers, (2) among varsity team sport players (basketball, field hockey, and volleyball, and (3) between varsity individual sport players (tennis and golf).

A t-test using the means and standard deviations from Cattell's normative group for each of the sixteen primary factors was computed for each of the six activity groups: tennis, golf, field hockey, basketball, volleyball, and dance. This permitted comparisons of each of these groups with a normal female college group. Using the mean of 5.5 and the standard deviation of 1.5, based on the sten score range of 1 - 10, further t-tests were done so the comparison of Cattell's normative group could be made for the four secondary factors using these same six groups. (4:116)

The personal data sheet information was tabulated for each group. Answers to Section C's questions were categorized by common responses. This information was sought to help describe the subjects and groups and not to serve as data for part of the statistical analysis.

CHAPTER V

ANALYSIS OF DATA

The purposes of this study were to compare selected personality factors of college women (1) who participated in varsity team sports, varsity individual sports, and a college dance company, (2) who participated in the varsity team sports of field hockey, basketball, and volleyball, (3) who participated in the varsity individual sports of tennis and golf, and (4) in addition, to compare participants in varsity team sports, varsity individual sports, and a college dance company with a normative group.

PERSONAL DATA SHEET SUMMARY

Seventy-eight undergraduate women from The University of North Carolina at Greensboro agreed to be subjects for this study. Twenty-six percent of all the subjects were under nineteen years of age. Fifty-four percent were between the ages of nineteen and twenty. Twenty percent were between the age range of twenty-one and twenty-four as shown in Table III, page 34.

The dance company members were mainly dance majors. Out of sixteen dance subjects, only one had not majored in dance. A large proportion of the varsity sports subjects, basketball, field hockey, and volleyball players, were physical education majors. Although the golf and tennis subjects had six out of eleven, and

TABLE III
NUMBER OF SUBJECTS IN EACH AGE RANGE
FOR THE SIX TESTED GROUPS

Tested Groups	Age Group			
	Below 19	19 - 20	21 - 24	25+
Dance	4	9	3	-
Golf	1	7	3	-
Tennis	7	15	4	-
Basketball	5	7	5	-
Field hockey	5	10	4	-
Volleyball	4	6	1	-

nine out of twenty-six respectively from physical education, the other five and seventeen subjects majored in areas other than physical education. This information is detailed in Table IV, page 35.

The high school background was examined to see how many subjects had participated in varsity team sports, varsity individual sports, and dance groups. Fifty-eight percent of all subjects had played on a varsity team sport, and forty percent had played on a varsity individual sport. Only ten percent of the subjects had participated with a dance group. See Table V, page 36.

Experience with varsity sports and dance groups ranged from one to six years. Golfers and field hockey players appeared to have the least number of subjects who had played varsity sports. The dance group included a limited number exposed to varsity sports;

TABLE IV
THE MAJOR ACADEMIC AREA
OF THE SUBJECTS

Subject Group	Dance	Golf	Tennis	Basket- ball	Field Hockey	Volley- ball
Art education			2			
Biology		1		1		
Dance	15					
Early childhood		1				
Economics		1		1		1
English			1			
French			1			
Health		1				
History	1		1			
Home economics						
Mathematics			3	1	1	
Nursing			1		1	
Nutrition			1			
Physical education		6	9	14	16	10
Psychology			1			
Recreation		1	1			
Sociology			1			
Undecided			4		1	

TABLE V
THE NUMBER OF SUBJECTS IN THE SIX TESTED GROUPS
WHO HAD PARTICIPATED ON HIGH SCHOOL VARSITY
TEAMS AND DANCE GROUPS

	Dance	Golf	Tennis	Basketball	Field Hockey	Volleyball
Team varsity sports NO	12	5	7	2	5	2
Team varsity sports YES	4	6	19	15	14	9
Number of years participated	3 for 1 yr. 1 for 3 yrs.	1 for 1 yr. 2 for 3 yrs. 3 for 4 yrs.	2 for 1 yr. 5 for 2 yrs. 8 for 3 yrs. 3 for 4 yrs. 1 for 5 yrs.	6 for 3 yrs. 8 for 4 yrs. 1 for 6 yrs.	1 for 1 yr. 7 for 3 yrs. 6 for 4 yrs.	2 for 2 yrs. 6 for 3 yrs. 1 for 4 yrs.
Individual varsity sports NO	14	7	8	13	13	5
Individual varsity sports YES	2	4	18	4	6	6
Number of years participated	1 for 2 yrs. 1 for 6 yrs.	1 for 1 yr. 1 for 2 yrs. 1 for 3 yrs. 1 for 4 yrs.	2 for 1 yr. 4 for 2 yrs. 8 for 3 yrs. 3 for 4 yrs. 1 for 5 yrs.	1 for 1 yr. 1 for 2 yrs. 2 for 3 yrs.	1 for 2 yrs. 2 for 3 yrs. 3 for 4 yrs.	2 for 2 yrs. 3 for 3 yrs. 1 for 4 yrs.

TABLE V (continued)

	Dance	Golf	Tennis	Basketball	Field Hockey	Volleyball
Dance group NO	11	11	24	17	17	10
Dance group YES	5	-	2	-	2	1
Number of years participated	1 for 1 yr. 2 for 2 yrs. 2 for 3 yrs.	-	2 for 3 yrs.	-	1 for ? yrs. 1 for 3 yrs.	1 for 3 yrs.

but they seemed to be limited in past exposure to dance groups also. Only five of the sixteen had previously belonged to a dance company.

Basketball players had the largest representation on high school varsity teams. Fifteen of the seventeen subjects had participated on a varsity team. Tennis players were probably the most experienced group. Nineteen of the twenty-six subjects had played a varsity team sport, and eighteen had played on an individual varsity sport team during their high school years.

The two most frequently expressed reasons any subject played varsity sports or participated in a dance group were for enjoyment and fun, and for companionship. Besides the reasons noted in Table VI, page 39, a few subjects indicated that they played a sport because a coach was enthusiastic or because they themselves liked to help other people. One field hockey and one tennis player said that they played those sports because they felt inferior in other sports.

Subjects who played varsity sports expressed the liking for competition. They commented on the fact that the sport was a challenge. The dance subjects appeared to be oriented toward their major area of study. Many expressed a desire to gain experience and to improve their skills and techniques. Compared to the other groups questioned, the dancers were thinking more of future use of the experiences gained from their participation with the dance company.

TABLE VI
NUMBER OF SUBJECTS WHO INDICATED PARTICULAR
REASONS FOR PARTICIPATION IN VARSITY
SPORTS AND DANCE

	Dance	Golf	Tennis	Basket- ball	Field Hockey	Volley- ball
Enjoyment and fun	7	6	8	11	11	5
To improve skills	6		7		7	3
Opportunity to gain experience	10	3	7	2	2	
Exercise is important		1		2		1
Exercise and con- ditioning	1	1	1	4	5	2
Relaxation and outlet of tensions			8	3		3
Enjoys competition		4	12	11	5	4
Opportunity to meet people and have companionship	4	6	10	11	5	6
Hope to teach or coach in area	4	1	1	2	2	2

TABLE VI (continued)

	Dance	Golf	Tennis	Basket- ball	Field Hockey	Volley- ball
Challenge		5	3	2	3	4
Satisfaction and feel accomplishment		6	1	2	2	
Gives opportunity to perform in major area of study	3					
Want to be a pro- fessional	3					

STATISTICAL ANALYSIS

A one-way analysis of variance was done for each of Cattell's sixteen primary factors and for each of the four secondary factors. The analyses of variance were completed for individual varsity sports of tennis and golf, varsity team sports of field hockey, basketball and volleyball, and for the three major groups of dancers, varsity team sports, and varsity individual sports.

Dancers, Varsity Team Sports and Varsity Individual Sports

The analysis of variance indicated significant Fs at the five percent level of confidence for Factors I, M, and Q_4 for the dance group, varsity team sport players and the varsity individual sport players. In instances where Fs indicated differences which were statistically significant, the Scheffé test was used to determine which groups differed. (9) Variable M, practical vs imaginative, was not significantly different when the mean difference of dancers and team sport players was compared with the Scheffé result. It cannot be concluded that dancers, even though they had a higher mean score, were more imaginative and less practical than team sport players. See Table VII, page 42 and Table VIII, page 44.

However, on Variable I, tough-mindedness vs tender-minded, there was a significant difference between dancers and team sport players. The latter were more tough-minded, that is, self-reliant and realistic, than the dancers. The dancers were more sensitive and over-protected.

TABLE VII
ANALYSIS OF VARIANCE RESULTS OF 16 PRIMARY FACTORS
AND 4 SECONDARY F FACTORS FOR DANCE, INDIVIDUAL
SPORTS AND TEAM SPORTS

Factors	Sum of Squares Between	Sum of Squares Within	Mean of Square Between	Mean of Square Within	F
A	10.7382	1339.2618	5.3691	13.8068	.3889
B	.8191	256.9706	.4096	2.6492	.1546
C	17.4146	1248.6954	8.7073	12.8731	.6764
E	38.3345	2094.6656	19.1672	21.5945	.8876
F	10.6535	2074.3365	5.3267	21.3849	.2491
G	22.6055	1587.9845	11.3027	16.3710	.6904
H	6.6194	4011.5706	3.3097	41.3564	.0800
I	86.7082	837.8018	43.3541	8.6371	5.0195*
L	4.8295	921.75	2.4147	9.5043	.2541
M	91.8547	1315.9053	45.9274	13.5660	3.3855*
N	13.3431	833.2969	6.6716	8.5907	.7766
O	58.5209	1647.6391	29.2605	16.9860	1.7226

TABLE VII (continued)

Factors	Sum of Squares Between	Sum of Squares Within	Mean of Square Between	Mean of Square Within	F
Q ₁	5.2903	1036.2697	2.6451	10.6832	.2476
Q ₂	1.3410	1266.7691	.6705	13.0595	.0513
Q ₃	23.4450	1358.315	11.7225	14.0032	.8371
Q ₄	141.5406	2020.4594	70.7703	20.8295	3.3976*
F ₁	15.9156	426.4856	7.9578	4.3968	1.8099
F ₂	.8058	540.4793	.4029	5.5720	.0723
F ₃	14.8157	280.0007	7.4079	2.8866	2.5663
F ₄	20.809	468.1286	10.4045	4.8261	2.1559

*F significant at 5 per cent (3.09), and one per cent (4.82) for two and ninety-seven degrees of freedom.

TABLE VIII
RESULTS OF SCHEFFÉ TEST ON SIGNIFICANT F'S
FOUND AMONG PRIMARY AND SECONDARY FACTORS

Groups	Factors	Significant F at 5%	Difference in Means	Scheffé Result	Signifi- cant
Dance, Individual and Team Groups					
Dance and team	I	5.0195	2.6888	2.1151	Yes
Dance and team	M	3.3854	2.6410	2.6506	No
Dance and team	Q ₄	3.3976	3.4082	3.2845	Yes
Team Groups					
Field hockey and volleyball	O	7.2161	4.8947	3.3773	Yes
Field hockey and basketball	Q ₁	3.9508	2.5882	2.60297	No
Field hockey and volleyball	Q ₂	4.1561	3.8469	3.3933	Yes
Field hockey and volleyball	Q ₄	8.8686	5.9761	3.7797	Yes
Field hockey and basketball	Q ₄	8.8686	3.7461	3.3302	Yes
Field hockey and volleyball	F ₁	7.7915	2.5727	1.7141	Yes
Field hockey and basketball	F ₁	7.7915	1.5176	1.5101	Yes
Field hockey and volleyball	F ₄	5.1205	2.4373	2.02298	Yes

Similarly, on Variable Q_4 , relaxed vs tense, the dancers were more tense, frustrated, and over-wrought than the collective group of team sport players. Possibly there was an earlier indication of this trait, as it was the dancers who said they participated in the dance company to further their experience in dance and to gain skills and knowledges that would be useful later. Variable Q_4 is a factor which Cattell suggested can change with circumstances and new situations. It may be that some of the worry and tenseness is derived from the fact that the dancers participated in the dance company to gain experience and improve their performance. They may be creating their own pressures which produce more tension and anxiety.

Hein (19) had found that dancers were more neurotic, introverted, and less socially stable than team players. The results of the present study did not show that dancers were more neurotic and introverted than team players. In order for that to have been shown, there would have had to be a significant difference on Factors C and FII. A reason for the difference between the two studies may be that Hein's dance subjects were students who selected dance as a first choice for participation recreationally and were not dance majors. However, just as Hein noted a difference between dancers and team subjects, so too was a difference found in the present study. Obviously, more research will have to be done to determine if there is a consistent difference.

Unlike the Peterson (12) and Malumphy (10) studies, this study did not report any significant differences between individual

sport players and team sport players. A possible explanation may be that the numbers tested in individual sports (37) were too small to reveal differences. A related problem was the fact that, of the twenty-six tennis players, sixteen did only tennis, and of the eleven golfers, eight did only golf. This meant that ten tennis players and three golfers played on various team sports, thus reducing even more the number of true individual sport players.

Field Hockey, Basketball and Volleyball

The one-way analysis of variance revealed six significant Fs among the varsity team players in field hockey, basketball and volleyball. Factors O, Q_4 and F_1 , F_4 , Q_1 and Q_2 were significant at the five percent level as indicated in Table IX, page 47. Scheffé tests were done and the results were compared with the respective differences between the high and low mean for a factor. Factor O, Q_2 , Q_4 , F_1 and F_4 remained significantly different. Factor Q_1 , conservative vs experimenting, was not significantly different after the Scheffé test was completed (see Table VIII, page 44).

Field hockey players had a higher mean on Factor O than did volleyball players. This suggested that field hockey players tended to be more apprehensive, self-reproaching, and worrying than did volleyball players. The latter were more self-assured, confident and serene.

Field hockey players had a significantly higher mean than volleyball players on variable Q_2 and Q_4 as well. Variable Q_2

TABLE IX
ANALYSIS OF VARIANCE RESULTS OF 16 PRIMARY FACTORS
AND 4 SECONDARY F FACTORS FOR FIELD HOCKEY,
BASKETBALL AND VOLLEYBALL

Factors	Sum of Squares Between	Sum of Squares Within	Mean of Square Between	Mean of Square Within	F
A	13.9674	580.0326	6.9837	13.1826	.5297
B	3.6155	137.6611	1.8077	3.1287	.5778
C	34.1153	353.5868	17.0576	8.0360	2.1226
E	65.9127	1110.3	32.9564	25.2341	1.3060
F	4.6640	933.1658	2.3320	21.2083	.10995
G	41.8370	780.1205	20.9185	17.7300	1.1798
H	37.8685	1962.0889	18.9343	44.5929	.4246
I	11.0494	395.7591	5.5247	8.9945	.6142
L	37.1984	495.0144	18.5992	11.2503	1.6532
M	74.0140	621.4115	37.0070	13.9184	2.6588
N	15.7703	375.5063	7.8851	8.5342	.9239
O	178.6736	544.7307	89.3368	12.3802	7.2161*

TABLE IX (continued)

Factors	Sum of Squares Between	Sum of Squares Within	Mean of Square Between	Mean of Square Within	F
Q ₁	74.8572	416.8449	37.4286	9.4737	3.9508*
Q ₂	103.8911	549.9386	51.9456	12.4986	4.1561*
Q ₃	40.9714	559.5818	20.4857	12.7178	1.6108
Q ₄	275.0308	682.2803	137.5194	15.5064	8.8686*
F ₁	49.6909	140.3065	24.8455	3.1888	7.7915*
F ₂	5.1530	249.2956	2.5765	5.6658	.4547
F ₃	2.3922	134.3120	1.1961	3.0525	.3918
F ₄	45.4938	195.4611	22.7469	4.4423	5.1205*

*F significant at 5 per cent (3.21) and one per cent (5.12) for two and forty-four degrees of freedom.

is related to group dependency vs self-sufficiency. Field hockey players were more self-sufficient than volleyball players who were group dependent. Five of the eleven volleyball players had stated that they played the sport to have companionship. Five of the field hockey players gave that as a reason for playing the sport. On Variable Q_4 , relaxed vs tense, field hockey players scored higher on the tense side of the continuum than either volleyball or basketball players. Both of the latter groups were more relaxed. There was not a significant difference between basketball players and volleyball players on this variable.

Because the field hockey players had been more apprehensive, Factor O, and tense, Factor Q_4 , than the basketball and volleyball players, it was logical that on the secondary order Factor F_1 , low anxiety vs high anxiety, the results indicated field hockey players were more anxious than the other two groups. There was no significant difference between volleyball and basketball players on Factor F_1 .

The secondary order Factor F_4 was determined by a weighted combination of the primary factors E, M, A, G, Q_1 and Q_2 . Factors Q_1 and Q_2 were significant, but Factor Q_1 failed to be significant after the Scheffé test was completed. However, both factors Q_1 and Q_2 no doubt helped to weight Factor F_4 in the Scheffé test. Factor F_4 , subduedness vs independence, revealed that field hockey players were more independent and less group dependent than volleyball players.

Tennis and Golf

In the analysis of the varsity individual sport players, one factor was significantly different at the five percent level of confidence (see Table X, page 51). This was the primary Factor G. Golfers had a mean of 14.2727 for Factor G and the mean for tennis players was 11.2692. Cattell stated that subjects who score low on Factor G are more expedient, disregard rules, and feel few obligations. Those who score high on Factor G are conscientious, persevering, staid and moralistic. They have a stronger superego strength. (3) The higher mean of the golfers indicated that they were more conscientious than the tennis players tested. Six of the eleven golfers said that they played golf to gain satisfaction and to experience accomplishment. Only one of the twenty-six tennis players gave that reason for playing tennis. Thus, it may be because golfers tend to be more conscientious and more persevering than tennis players that golfers do gain or experience satisfaction from persevering with an activity. Conversely, it may be that because they need to feel satisfaction and accomplishment they persevere.

The possibilities for significant differences from the analyses of variance numbered 140. This was found by multiplying the twenty factors by the three main groups, by the two varsity individual sport groups, and by the three varsity team sport groups. The total number of significant differences, noted after all the statistical tests had been completed, was ten. The fact that only ten findings were significant out of a possible 140 suggested that

TABLE X

ANALYSIS OF VARIANCE RESULTS OF 16 PRIMARY FACTORS
AND 4 SECONDARY F FACTORS FOR GOLF AND TENNIS

Factors	Sum of Squares Between	Sum of Squares Within	Mean of Square Between	Mean of Square Within	F
A	.0341	552.2902	.0341	15.7797	.0022
B	.0015	78.7552	.0015	2.2501	.0007
C	14.6698	660.5734	14.6698	18.8735	.7773
E	4.9125	641.7902	4.9125	18.3369	.2679
F	4.8267	807.9301	4.8267	23.0837	.2091
G	69.7298	569.2972	69.7298	16.2656	4.2869*
H	18.88196	1522.7937	18.88196	43.5084	.43398
I	.3516	306.8916	.3516	8.7683	.0401
L	2.4801	279.7902	2.4801	7.9940	.3102
M	34.2472	437.4825	34.2472	12.4995	2.7399
N	1.4766	318.7937	1.4766	9.1084	.1621
O	4.6155	582.6818	4.6155	16.6481	.2772

TABLE X (continued)

Factors	Sum of Squares Between	Sum of Squares Within	Mean of Square Between	Mean of Square Within	F
Q_1	6.6864	330.8811	6.6864	9.4537	.7073
Q_2	.4899	336.6993	.4899	9.61998	.0509
Q_3	17.1495	549.1748	17.1495	15.6907	1.0930
Q_4	21.3216	717.3811	21.3216	20.4966	1.0402
F_1	6.9556	183.1726	6.9556	5.2335	1.3290
F_2	.1357	217.2151	.1357	6.2061	.0219
F_3	.3146	91.6443	.3146	2.6184	.1202
F_4	6.7318	138.7726	6.7318	3.9649	1.6978

*F significant at 5 per cent (4.11) and one per cent (7.39) for one and thirty-five degrees of freedom.

the groups tested in this study were relatively similar in their personality traits.

Normative Group

In order to compare the six groups with the normative group, t tests were computed. The normative group was Cattell's 1,679 female undergraduate subjects. The means and standard deviations for each factor for the normative group were available in the material which was included with the test manual and are presented in Table XII of Appendix B. The means and standard deviations for each primary and secondary factor for the subjects involved in this study were determined at the time the analyses of variance were done. These results are shown in Tables XII and XIII of Appendix B. The formula used in the t test was the one required for computer analysis of a t for larger uncorrelated data. (4:116) Thirty-five significant t s were found at the five percent level of confidence (1.96) between Cattell's normative group and the dancers, golfers, tennis, field hockey, volleyball, and basketball players considered in this study. Table XI, page 54, has this information.

Dancers were more reserved, Factor A, and less outgoing than the normative group. Also, they were less emotionally stable, Factor C, than the normative group.

Both dancers and varsity field hockey players were more assertive, Factor E, and less humble, mild, and accommodating than the normative group.

Varsity golfers were the only subjects tested who had a significant t on Factor G. Earlier it was noted that golfers were

TABLE XI

RESULTS OF THE t-TEST FOR EACH OF THE SIX
GROUPS AND CATTELL'S NORMATIVE GROUP

Factors	Dance	Golf	Tennis	Field Hockey	Volleyball	Basketball
A	-1.974*	- .884	-1.244	-1.679	.118	- .723
B	.526	.719	1.061	.975	.217	1.891
C	-1.967*	.131	-1.585	-1.859	.440	- .626
E	2.488*	.250	1.343	3.160*	.036	1.521
F	- .393	- .336	.415	.201	.782	.472
G	-1.495	1.999*	-1.163	-1.067	1.328	- .716
H	- .524	.404	- .743	- .228	.871	- .556
I	.721	-1.668	2.925*	-2.745*	-1.981*	-3.963*
L	.619	.018	.898	1.985*	- .712	1.493
M	1.451	-2.629*	.978	.169	-1.941	-3.045*
N	- .391	- .364	-1.349	-2.653*	.257	1.880
O	2.547*	.198	1.330	2.732*	-2.179	- .476

TABLE XI (continued)

Factors	Dance	Golf	Tennis	Field Hockey	Volleyball	Basketball
Q ₁	1.089	- .475	.628	2.932*	- .476	- .647
Q ₂	.312	- .224	.022	1.992*	-2.114*	- .083
Q ₃	-1.341	1.385	- .164	-1.672	.656	.759
Q ₄	3.145*	.249	2.171*	2.824*	-2.054	- .602
F ₁	3.710*	- .419	2.530*	4.036*	-2.586*	- .321
F ₂	-	.080	- .320	- .362	1.578	.144
F ₃	.165	2.284*	2.811*	2.703*	2.564*	3.962*
F ₄	3.676*	-1.302	1.112	3.940*	-2.344	- .368

*Significant at the 5 percent level (1.96).

more conscientious than varsity tennis players. The results of the t test revealed that varsity golfers were more conscientious and less expedient than Cattell's normative group.

Factor I, tough-minded vs tender-minded, had significant ts for varsity tennis, field hockey, basketball, and volleyball players. The varsity tennis and team sport players were all more tough-minded, self-reliant and realistic than the normative group.

Only varsity field hockey players had a significant t for Factor L, trusting vs suspicious. They were less trusting and more suspicious than Cattell's normative group.

Varsity golfers and basketball players had significant ts on Factor M, practical vs imaginative. Both groups were more practical than the normative group. They were less imaginative than the normative group.

On Factor N, forthright vs shrewd, a significant difference was noted for varsity field hockey players. They were more forthright, natural, and unpretentious than the normative group.

Three groups had significant ts on Factor O. Dancers and varsity field hockey players were both more apprehensive, self-reproaching and worrying than the normative group, whereas varsity volleyball players were more self-assured and confident than the normative group. Earlier the significant Fs had revealed that varsity field hockey players were more apprehensive than the varsity volleyball players. Thus, it would seem that for Factor O the normative group's average seemed to be between varsity field hockey players and varsity volleyball players.

One significant t was found for Factor Q_1 , conservative vs experimenting. Varsity field hockey players were more liberal, free thinking, and experimenting than the normative group. Likewise, on Factor Q_2 , varsity field hockey players were more self-sufficient, resourceful, and less group dependent than the normative group. However, on Factor Q_2 , varsity volleyball players were more group dependent than the normative group. This difference between varsity field hockey and volleyball players had been seen earlier for Factor Q_2 .

There were four significant t s for Factor Q_4 , relaxed vs tense. Dancers, varsity tennis and field hockey players were more tense and less relaxed than the normative group, whereas varsity volleyball players were more relaxed and less tense. A similar pattern showed for the secondary factor, F_1 . Again, dancers, varsity tennis, and field hockey players were more anxious than the normative group while the varsity volleyball players were less anxious than Cattell's group.

Varsity individual sport players (golf and tennis) and varsity team sport players (field hockey, basketball and volleyball) all had significant t s on Factor F_3 . This meant that they were more enterprising, alert, decisive, and resilient than the normative group. Possibly it is athletes with this trait who seek to participate in sports at the varsity level. Conversely, it may be that through participation in varsity individual and team sports, participants develop or enhance this trait.

The secondary factor F_4 , subduedness vs independence, was significant for the following groups: dance, field hockey, and volleyball. The dancers and varsity field hockey players were more independent, aggressive, and daring than the normative group. However, the varsity volleyball players were more group dependent, passive, and needed support from other people more than the normative group.

The possibilities for significant ts numbered 120. This was determined by multiplying the twenty factors by the six groups tested. Only thirty-five ts were significant.

The field hockey group was probably the most different from the normative group because it showed significant ts for eleven of the twenty factors, nine of those factors had higher means than the normative group's means. The means were lower than the normative group's on two of the factors. Interestingly enough, the volleyball group had significant ts for seven of the twenty factors. The means on each of these were lower than the normative group means. The basketball players, golfers, and tennis players showed significant ts on only three or four of the twenty factors. They were probably the most like the normative group. The dancers had seven significant ts. Of the seven factors which were significant, two of the means were lower and five were higher than the normative group's means. The dancers were the only group that had significant ts on Factors A and C. These were the two factors with lower means.

The results of this study showed some significant differences in personality traits of groups who had either selected or had been selected to participate on varsity individual and team sports, and a dance company. However, the study was limited due to the small numbers in each group tested, and because some subjects participated in more than one classification, for example team and individual sports. Larger numbers of subjects tested for each activity would help to make any findings more reliable. Also, if subjects belonged to only one activity, there would not be the question of cross influence occurring.

Before examining the established hypotheses to see whether they are to be found tenable or rejected, it must be remembered that twenty factors were considered for each hypotheses. Thus, a hypothesis may be entirely tenable, or it may be tenable with exceptions because there were factors which were significantly different. The five percent level of confidence was accepted.

Hypothesis 1

There are no differences in each of Cattell's sixteen primary factors and each of the four F factors among dancers, varsity team sport players, and varsity individual sport players is tenable for fifty-eight of the sixty factors. The exceptions are Factors I and Q₄ for dancers and varsity team sport players.

Hypothesis 2

There are no differences in each of Cattell's sixteen primary factors and each of the four F factors among varsity team

sport players in field hockey, basketball, and volleyball is tenable for fifty-three of the sixty factors. The exceptions are for field hockey players and volleyball players on factors O and Q₂, field hockey players, and both volleyball and basketball players on Factor Q₄, field hockey players and volleyball players, and field hockey players and basketball players on Factor FI, and finally field hockey players and volleyball players on F₄.

Hypothesis 3

There are no differences in each of Cattell's sixteen primary factors and each of the four F factors between varsity tennis players and golfers is tenable for thirty-nine of the forty factors. The exception is Factor G which was significantly different.

Hypothesis 4

There are no differences in each of Cattell's sixteen primary factors and each of the four F factors between dancers and Cattell's normative group is tenable for thirteen of the twenty factors. The exceptions are factors A, C, E, O, Q₄, F₁, and F₄ which were significantly different.

Hypothesis 5

There are no differences in each of Cattell's sixteen primary factors and each of the four F factors between varsity team sport players and Cattell's normative group is tenable for forty-nine of the sixty factors. The exceptions are factors E, I, L, N, O, Q₁, Q₂, Q₄, F₁, F₃ and F₄ for varsity field hockey players.

The exceptions for varsity basketball players are factors I, M, and F₃, while the exceptions for varsity volleyball players are factors I, O, Q₂, Q₄, F₁, F₃, and F₄.

Hypothesis 6

There are no differences in each of Cattell's sixteen primary factors and each of the four F factors between varsity individual sport players and Cattell's normative group is tenable for thirty-three of the forty factors. The exceptions are factors G, M, and F₃ for varsity golfers, and factors I, Q₄, F₁ and F₄ for varsity tennis players.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purposes of this study were to compare selected personality factors of college women (1) who participated in varsity team sports, varsity individual sports, and a college dance company, (2) who participated in the varsity team sports of field hockey, basketball, and volleyball, (3) who participated in the varsity individual sports of tennis and golf, and (4) in addition, to compare participants in varsity team sports, varsity individual sports, and a college dance company with a normative group.

Seventy-eight female undergraduate students from The University of North Carolina at Greensboro agreed to be subjects. They represented varsity individual sports of tennis and golf, the varsity team sports of field hockey, basketball, and volleyball, and a college dance company.

All subjects completed a personal data sheet which gave background information related to age, previous varsity sport experience, previous dance group experience, and reasons for participating in an activity.

The subjects also completed the Cattell Sixteen Personality Factor Questionnaire, Form A. After the tests were scored, the four secondary factors were determined. Then, using computer techniques, a one-way analysis of variance was run on each of

the sixteen primary and four secondary factors. It was necessary to follow up the significant Fs with a Scheffé test to identify the significantly different factors. Only two significant Fs remained after sixty analyses of variance tests on twenty factors were done and the resulting Scheffé tests were completed for dancers, varsity team sport players, and varsity individual sport players. At the five percent level of confidence, the following results became apparent:

1. Dancers were more tender-minded (Factor I) and less tough-minded, practical, and realistic than the subjects who participated in varsity team sports.
2. Dancers were more tense (Factor Q₄) and less relaxed than the varsity team players.

Similarly, sixty analyses of variance tests were completed on the twenty factors for varsity team sport players of field hockey, basketball, and volleyball. After the Scheffé tests were completed, only seven significant Fs remained. At the five percent level, the results were:

3. Varsity field hockey players were more apprehensive than varsity volleyball players (Factor O). Volleyball players were more self-assured than the field hockey subjects.
4. Varsity field hockey players were more self-sufficient and less group dependent (Factor Q₂) than the varsity volleyball players.
5. Varsity field hockey players were more tense than varsity volleyball players (Factor Q₄).

6. Varsity field hockey players were more tense than varsity basketball players (Factor Q₄). Both varsity volleyball and basketball players were more relaxed than the field hockey subjects. There was no significant difference between the varsity volleyball and basketball players.

7. Varsity field hockey players showed higher anxiety (Factor FI) than the varsity basketball players.

8. Varsity field hockey players showed higher anxiety (Factor FI) than varsity volleyball players. No significant difference was found between varsity basketball and volleyball players on Factor FI.

9. Varsity field hockey players were more independent, less group dependent, and less subdued than the varsity volleyball team (Factor F₄).

The data for varsity individual sport players of tennis and golf were used for analysis of variance run on the computer, too. Only one significant F at the five percent level of confidence was noted:

10. Varsity golfers (Factor G) were more conscientious and persevering than the varsity tennis players who were more expedient.

In order to compare the subjects with Cattell's normative group, a t-test was done on each of the sixteen primary and four secondary factors for each activity group tested (dance, tennis, golf, field hockey, volleyball, and basketball).

At the five percent level of confidence, the results showed the following thirty-five significant ts:

1. Dancers were more reserved and less outgoing (Factor A) than the normative group.
2. Dancers were more affected by feelings and less stable (Factor C) than the normative group.
3. Dancers were more assertive and aggressive (Factor E) than the normative group.
4. Dancers were more apprehensive and self-reproaching (Factor O) than the normative group.
5. Dancers were more tense and less relaxed (Factor Q₄) than the normative group.
6. Dancers were higher on anxiety (Factor F₁) than the normative group.
7. Dancers were more independent and less subdued (Factor F₄) than the normative group.
8. Varsity field hockey players were more aggressive and assertive (Factor E) than the normative group.
9. Varsity field hockey players were more tough-minded, self-reliant and less venturesome (Factor I) than the normative group.
10. Varsity field hockey players were more suspicious and less trusting (Factor L) than the normative group.
11. Varsity field hockey players were more forthright and less shrewd (Factor N) than the normative group.

12. Varsity field hockey players were more apprehensive and less self-assured (Factor O) than the normative group.
13. Varsity field hockey players were more experimenting and liberal (Factor Q₁) than the normative group.
14. Varsity field hockey players were more self-sufficient and less group dependent (Factor Q₂) than the normative group.
15. Varsity field hockey players were more tense and less relaxed (Factor Q₄) than the normative group.
16. Varsity field hockey players were higher on anxiety (Factor F₁) than the normative group.
17. Varsity field hockey players were more alert and poised (Factor F₃) than the normative group.
18. Varsity field hockey players were more independent and less subdued (Factor F₄) than the normative group.
19. Varsity basketball players were more tough-minded, self-reliant and realistic (Factor I) than the normative group.
20. Varsity basketball players were more practical and less imaginative (Factor M) than the normative group.
21. Varsity basketball players were more alert and poised (Factor F₃) than the normative group.
22. Varsity volleyball players were more tough-minded, self-reliant and realistic (Factor I) than the normative group.
23. Varsity volleyball players were more self-assured and less apprehensive (Factor O) than the normative group.
24. Varsity volleyball players were more group dependent and less self-sufficient (Factor Q₂) than the normative group.

25. Varsity volleyball players were more relaxed and less tense (Factor Q₄) than the normative group.

26. Varsity volleyball players were less anxious (Factor F₁) than the normative group.

27. Varsity volleyball players were more alert and poised (Factor F₃) than the normative group.

28. Varsity volleyball players were less independent and more subdued (Factor F₄) than the normative group.

29. Varsity golfers were more conscientious and less expedient (Factor G) than the normative group.

30. Varsity golfers were more practical and less imaginative (Factor M) than the normative group.

31. Varsity golfers were more alert and poised (Factor F₃) than the normative group.

32. Varsity tennis players were more tough-minded, self-reliant and realistic (Factor I) than the normative group.

33. Varsity tennis players were more tense and less relaxed (Factor Q₄) than the normative group.

34. Varsity tennis players were higher on anxiety (Factor F₁) than the normative group.

35. Varsity tennis players were more alert and poised (Factor F₃) than the normative group.

In summary, considering groups instead of factors, dancers were more assertive, apprehensive, tense, anxious, and independent than the normative group. They were less outgoing, and less emotionally stable than the normative group. Golfers were more

conscientious, practical, and controlled. Tennis players were more tough-minded, practical, and alert than the normative group. The volleyball players were more tough-minded, self-assured, group dependent, relaxed, had lower anxiety yet were more alert and subdued than the normative group. Varsity basketball players were more tough-minded, practical, and alert compared to the normative group. Varsity field hockey players had the greatest number of significant ts. They differed from Cattell's group on eleven of the twenty factors. They were more assertive, tough-minded, suspicious, forthright, apprehensive, experimenting, self-sufficient, tense, anxious, alert, and independent.

In conclusion it may be stated that the six groups tested were similar on a large proportion 130 of 140, or 93 percent, of the personality traits studied. They were also similar on the majority of personality traits, 85 or 120, or 70 percent, when compared to a normative population of college female undergraduates. It is true, however, that the groups were more similar one to another than they were to the normative group. The field hockey players seemed least like the normative group, and the golfers, tennis and basketball players were most like the normative group. The limitations of the study related to cross-influence and small numbers make any further conclusions unwise.

RECOMMENDATIONS OF THE STUDY

The author recommends a study be conducted on an inter-institutional basis. This would increase the number of subjects available, and possibly allow for selection of subjects who

participate at the varsity level in only one activity. Such a broader base to obtain subjects would also provide a better opportunity to test subjects in such other individual sports as swimming, track and field, and skiing.

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APPENDIXES

APPENDIX A

Cover Statement

Personal Data Sheet

COVER STATEMENT

Your co-operation is requested to study the personality traits of both superior athletes and dancers.

Although your name is on the personality questionnaire and the personal data sheet, it is there only for the purpose of placing each person in various groupings. This is a study of groups, not individuals. All information received will remain confidential.

Will the individuals who cannot take the test in a group situation please return the answer sheet, questionnaire booklet, and personal data sheet to my box (Jean Wilson) located near the student lounge in the basement of Coleman Gymnasium.

Please return by _____

If anyone should wish to know their own scores or how their scores compare with the norms established by the Institute for Personality and Ability Testing, please contact me - phone number 379-7434. I will be happy to show you your own papers when the tests have been scored.

Thank you for your co-operation and help in making this study possible.

Name _____

PERSONAL DATA SHEET

Section A

Answer by checking the most suitable statements.

1. At the University of North Carolina you are a member of

- a. varsity field hockey team ()
- b. varsity volleyball team ()
- c. varsity basketball team ()
- d. varsity tennis team ()
- e. varsity golf team ()
- f. college ballet company ()
- g. college modern dance ()
company

2. You are majoring in. (a) physical education _____
(b) dance _____

If in another area please state what (c) _____

3. You are an (a) undergraduate _____
(b) graduate _____

4. Your approximate age is. (a) below 19
(b) 19 - 20
(c) 21 - 24
(d) 25 and above

Section B

Answer each question by checking the YES or NO column at the right. If you check YES, please indicate in the space provided the number of years that you participated.

- | | <u>YES</u> | <u>NO</u> | <u>No. of
Years</u> |
|---|---------------|---------------|-------------------------|
| 1. During your high school years did you play on a varsity team for team sports such as volleyball, basketball or field hockey? | <u> </u> | <u> </u> | <u> </u> |
| 2. During your high school years did you play on a varsity team for individual sports such as tennis, golf, or swimming? | <u> </u> | <u> </u> | <u> </u> |

	<u>YES</u>	<u>NO</u>	<u>No. of Years</u>
3. During your high school years, did you belong to a dance group within the school?	<u> </u>	<u> </u>	<u> </u>

Section C

Space is provided below for answering the following question:

Why are you presently a member of a varsity individual sport, a varsity team sport, or the dance company?

APPENDIX B

Raw Data

TABLE XII

MEANS AND STANDARD DEVIATIONS FOR THE DANCE, INDIVIDUAL
VARSITY SPORTS, AND TEAM VARSITY SPORTS GROUPS, AND
FOR CATTELL'S NORMATIVE GROUP

Factors	Dance		Individual Sport		Team Sport		Normative Group	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S. D.
A	10.0625	3.5864	10.8649	3.9169	11.0000	3.5935	11.7	3.3
B	8.9375	1.5692	9.0810	1.4791	9.1915	1.7525	8.7	1.8
C	13.3750	3.5189	14.4865	4.3309	14.5319	2.9032	15.3	3.9
E	14.1250	4.25641	12.3784	4.2384	13.3191	5.0566	11.5	4.2
F	16.3750	4.6458	16.9189	4.7515	17.2979	4.5153	16.8	4.3
G	10.7500	2.9097	12.1622	4.2132	11.8511	4.2271	12.1	3.6
H	12.4375	5.5972	12.8108	6.5440	13.1489	6.5937	13.2	5.8
I	14.6250	2.8722	12.4864	2.9213	11.9362	2.9738	14.1	2.9
L	8.3125	2.6763	8.2162	2.8002	8.6809	3.4014	7.8	3.3
M	13.8750	3.2429	11.2973	3.6199	11.2340	3.8629	12.6	3.5
N	9.1250	2.8489	8.7380	2.9827	8.1915	2.9165	9.4	2.8
O	13.9375	4.7395	12.2703	4.0390	11.7234	3.9656	11.5	3.8
Q ₁	8.7500	3.7148	8.1081	3.0622	8.4681	3.2694	7.9	3.1

TABLE XII (continued)

Factors	Dance		Individual Sport		Team Sport		Normative Group	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Q_2	9.8750	4.2876	9.5405	3.0605	9.7021	3.7701	9.6	3.5
Q_3	10.6875	3.5725	12.1351	3.9663	11.6596	3.6132	11.8	3.3
Q_4	17.8125	4.6507	15.6216	4.5298	14.4043	4.5619	14.1	4.7
F_1	6.9000	1.7580	5.9757	2.2981	5.7489	2.0323	5.5	1.5
F_2	5.5000	2.1398	5.4432	2.4571	5.6362	2.3519	5.5	1.5
F_3	5.5625	1.8500	6.3946	1.5983	6.6766	1.7239	5.5	1.5
F_4	6.8936	2.3333	5.5649	2.0104	5.7574	2.2887	5.5	1.5

TABLE XIII
MEANS AND STANDARD DEVIATIONS FOR THE TWO
INDIVIDUAL VARSITY SPORTS, AND THE
THREE VARSITY TEAM SPORTS

Factors	Individual Varsity Sports				Team Varsity Sports					
	Tennis		Golf		Field Hockey		Basketball		Volleyball	
	Mean	S. D.	Mean	S. D.	Mean	S.D.	Mean	S. D.	Mean	S. D.
A	10.8846	4.2268	10.8182	3.2502	10.4211	3.4369	11.1176	3.8711	11.8182	3.5726
B	9.0769	1.5728	9.0909	1.3003	9.1053	1.9971	9.5294	1.6999	8.8182	1.4013
C	14.0769	4.1562	15.4545	4.7825	13.6316	2.7931	14.7059	3.3122	15.8182	1.9400
E	12.6154	4.3825	11.8182	4.0204	14.5789	5.9844	13.0588	4.5342	11.5455	3.6977
F	17.1538	5.1201	16.3636	3.9057	17.0000	5.0222	17.2941	3.9491	17.8182	4.7920
G	11.2692	4.5480	14.2727	2.2843	11.2105	4.6973	11.4706	4.2296	13.5455	3.1101
H	12.3462	6.6629	13.9091	6.4258	12.8947	7.1639	12.3118	6.9016	14.7273	5.2553
I	12.4231	2.9688	12.6364	2.9419	12.2632	2.9785	11.2941	2.3310	12.3636	2.4196
L	8.3846	2.9131	7.8182	2.6007	9.3158	4.1507	9.0000	2.9791	7.0909	2.0715
M	11.9231	3.6978	9.8182	3.0925	12.7368	3.8707	10.0000	3.7583	10.5455	3.4165
N	8.6538	2.8134	9.0909	3.4772	7.6842	3.0922	8.1176	2.5466	9.1818	3.1565
O	12.5000	4.1304	11.7273	3.9519	13.8947	3.7990	11.0588	3.7495	9.0000	2.4495

TABLE XIII (continued)

Factors	Individual Varsity Sports				Team Varsity Sports					
	Tennis		Golf		Field Hockey		Basketball		Volleyball	
	Mean	S. D.	Mean	S. D.	Mean	S. D.	Mean	S. D.	Mean	S. D.
Q ₁	8.3846	3.1123	7.4545	2.9787	10.0000	3.5277	7.4118	2.8517	7.4545	2.5045
Q ₂	9.6154	3.2506	9.3636	2.6934	11.2105	3.8236	9.5294	3.4662	7.3636	3.0748
Q ₃	11.6923	4.3429	13.1818	2.7863	10.5263	3.4216	12.4118	3.8578	12.4545	3.3276
Q ₄	16.1154	4.5372	14.4545	4.5025	17.1579	4.0451	13.4118	3.7090	11.1818	4.0943
F ₁	6.2577	2.3139	5.3091	2.2206	6.9000	1.8049	5.3824	1.9803	4.3273	1.3756
F ₂	5.4038	2.5189	5.5364	2.4204	5.3737	2.4882	5.5529	2.3974	6.2182	2.1423
F ₃	6.3346	1.6422	6.5364	1.5565	6.4368	1.7049	6.9529	1.9105	6.6636	1.5358
F ₄	5.8423	2.1602	4.9091	1.4869	6.8737	2.3331	5.3647	2.1386	4.4364	1.5590